Ethernet over VDSL2 Converter/Bridge

VC-231/VC-234

User's Manual

Trademarks

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FCC Warning

This equipment has been tested and found to comply with the regulations for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this user's guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Warning:

1) This device must be earthed.

2) For indoor use only!

CE Mark Warning

This device is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

Energy Saving Note of the Device

This power required device does not support Standby mode operation. For energy saving, please remove the power cable to disconnect the device from the power circuit. Without removing power cable, the device will still consume power from the power source. In view of Saving the Energy and reducing the unnecessary power consumption, it is strongly suggested to remove the power connection for the device if this device is not intended to be active.

WEEE Warning

To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

Revision

PLANET Ethernet over VDSL2 Converter/Bridge User's Manual

For Models: VC-231(V2)/VC-234(V2)

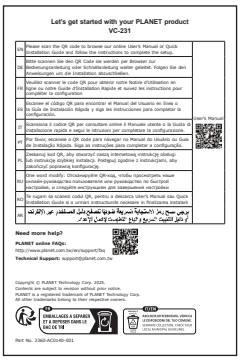
Revision: 2.1 (APRIL. 2026)

Table of Contents

1. Package Contents

Thank you for purchasing PLANET Ethernet over VDSL Converter/Bridge Series, VC-231 and VC-234. In the following sections, the term **"VDSL2 Bridge"** means the VC-231 Series.

Open the box of the VDSL2 Bridge and carefully unpack it. The box should contain the following items:

<table>
<tr><td colspan="2">VDSL2 Bridge x 1</td><td>QR Code Sheet x 1</td></tr>
<tr><td> 
VC-231 x 1</td><td> 
VC-234 x 1</td><td> 
</td></tr>
<tr><td>5V, 2A Power Adapter x 1</td><td>Splitter x 1 (VC-231)</td><td>RJ11 Telephone Wire x 1</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
</table>

If any of these are missing or damaged, please contact your dealer immediately; if possible, retain the carton including the original packing material, and use them again to repack the product in case there is a need to return it to us for repair.

2. Product Features

Physical

- VC-231
  - 1 10/100BASE-TX RJ45 auto-MDI/MDI-X port
  - 1 RJ11 connector for VDSL port with VDSL connection
  - Additional splitter for POTS connection
- VC-234
  - 4 10/100BASE-TX RJ45 auto-MDI/MDI-X ports
  - 1 RJ11 built-in splitters for POTS connection
  - 1 VDSL2 RJ11 female phone jack

VDSL Features

- Supports ITU-T G.993.2 **VDSL2 Profile 17a/30a**
- Up to 100/100Mbps bandwidth (in **Fast, 30A 6dB** mode)
- DMT-based coding technology
- CO/CPE mode selectable via DIP switch
- Selectable target band plan and SNR margin
- Voice and data communication can be shared simultaneously based on the existing telephone wire
- VDSL2 standalone transceiver for simple bridge modem application

Ethernet Features

- Complies with IEEE 802.3, 10BASE-T, IEEE 802.3u, 100BASE-TX Ethernet standards
- Supports up to 1522 bytes packet size, 802.1Q VLAN tag transparency
- Advantage of minimum installation time (Simply by Plug-and-Play)
- Supports extensive LED indicators for network diagnosis
- Compact in size and wall-mountable design with easy to install
- VC-231 Co-work with PLANET media converter chassis (MC-700/MC-1500/ MC-1500R/MC-1500R48)

3. Hardware Introduction

3.1 Front Panel and LED Indicators

■ VC-231 Front Panel

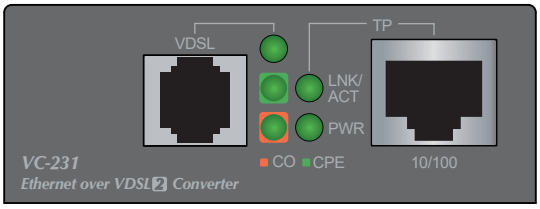


Figure 3-1-1: VC-231 Front Panel

- 10/100BASE-TX RJ45 connector for Ethernet
- RJ11 connector for VDSL2 for connecting to IP DSLAM or another VDSL2 Bridge
- LEDs for power, Ethernet and VDSL

■ VC-234 Front Panel

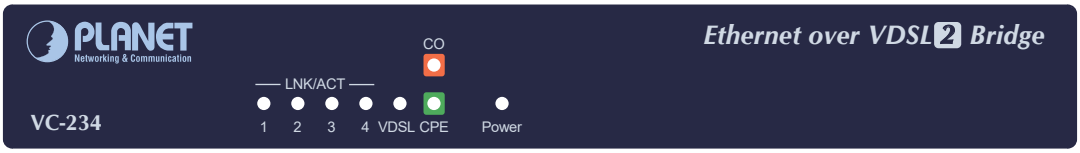


Figure 3-1-2: VC-234 Front Panel

- LEDs for power, Ethernet and VDSL status

■ LED Indicators

▶ System

LED	Color	Function	
PWR	Green	Lit	Indicates that the VDSL2 Bridge has power.
		Off	Indicates that the VDSL2 Bridge has no power.

▶ VDSL

LED	Color	Function	
VDSL	Green	Lit	Indicates that the VDSL link is established.
		Fast Blink	Indicates that the VDSL link is in training status.
		Off	Indicates that the VDSL link is in the idle status.
CO	Green	Lit	Indicates the VDSL2 Bridge is running in **CO** mode.
CPE	Green	Lit	Indicates the VDSL2 Bridge is running in **CPE** mode.

▶ 10/100BASE-TX Port for VC-231/VC-234

LED	Color	Function	
LNK/ACT	Green	Lit	To indicate that the port is operating at 10/100Mbps.
		Blink	To indicate that the VDSL Converter is actively sending or receiving data over that port at 10/100Mbps.
		Off	To indicate that the port link is down.

3.2 Rear Panel and DIP Switch

■ VC-231 Rear Panel

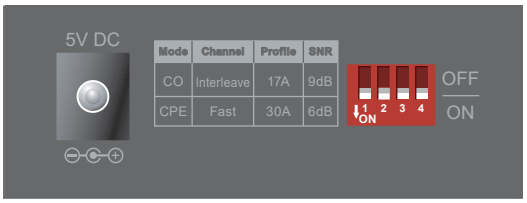


Figure 3-2-1: VC-231 rear panel

- ➢ DIP switch
- ➢ DC jack (DC input) for power adapter

■ VC-234 Rear Panel

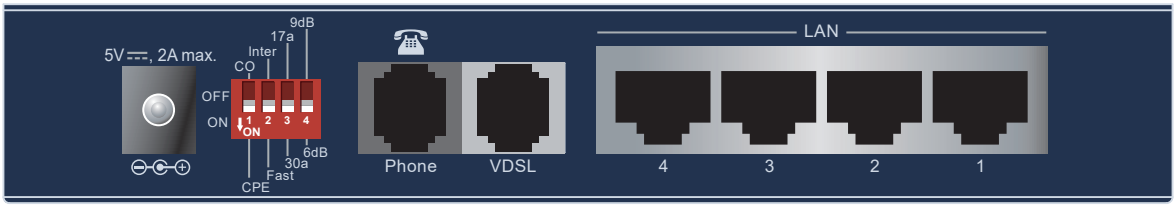


Figure 3-2-2: VC-234 rear panel

- Four 10/100BASE-TX RJ45 connectors for Ethernet
- One RJ11 connector for VDSL2 for connecting to IP DSLAM or another VDSL2 Bridge
- One RJ11 connector for telephone or PBX POTS
- DIP switch
- DC jack (DC input) for power adapter

■ DC Power Jack

The VDSL2 Bridge requires 5V DC, 2A power input, which conforms to the bundled AC adapter. Should you have the issue of power connection, please contact your local sales representative.

Note	The device is a power-required device, meaning it will not work till it is powered. If your networks should be active all the time, please consider using UPS (uninterrupted power supply) for your device. It will prevent you from network data loss or network downtime.

Note	In some areas, installing a surge suppression device may also help to protect your Ethernet over VDSL2 Bridge from being damaged by unregulated surge or current to the Ethernet over VDSL2 Bridge or the power adapter.

■ DIP Switch

The Ethernet over VDSL2 Bridge provides 4 selective transmission modes. By switching the transmission modes, you can obtain a best transmission mode to suit your phone line quality or distance of connectivity. The following is the summary table of transmission setting, bandwidth and distance extensibility tested for AWG 24 (0.5mm) twisted-pair without noise and cross talk.

	DIP-1	DIP-2	DIP-3	DIP-4
	Mode	Channel	Band	SNR Margin
OFF	CO	Interleave	17A	9dB
ON (default)	**CPE**	**Fast**	**30A**	**6dB**

▶ DIP-1: Mode (CO/CPE)

CO (Central Office)	The Master device mode, usually the CO device, is located at the data center of ISP or enterprise to link to the backbone.
CPE (Customer Premises Equipment)	The Slave device mode, usually the CPE device, is located at branch office, home or remote side as the long reach data receiver. The CPE can be connected to the PC, IP camera or wireless access point or other network devices.


Note

When the VDSL2 Bridge operates in **CPE mode**, DIP switches 2, 3, and 4 are **out of function**.

▶ DIP-2: Channel (Fast and Interleave mode)

Interleave	Interleaved mode provides impulse noises protection for any impulse noise with a duration less than 250 us. Interleaved mode has a maximum end to end latency of 10m sec.
Fast	Fast mode guarantees a minimum end-to-end latency less than 1 ms.

▶ DIP-3: Profile (17A/30A)

17A	When 17a is selected that provide longer distance link capability.
30A	When 30a is selected that provides better downstream/upstream performance in short distance.

▶ DIP-4: SNR (Signal Noise Ratio) Margin

When the SNR margin is selected, the system provides 9dB/6dB SNR margin for all usable loop lengths. Better channel noise protection is made with the higher SNR margin.

Note

By default, the four DIP switches, set at the **"ON"** position, are operated as **"CPE"**. For operating as **"CO"**, please turn DIP 1 Switch to the **"OFF"** position. Then adjust the other DIP switches accordingly to fulfill different network application demands.

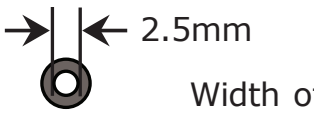
Note

Please **power off** the VDSL2 Bridge before making any transmission mode adjustment.

3.3 Power Information

The central posts of the VDSL2 Bridge's power jacks measure **2.5mm** wide that require +5VDC power input. They conform to the bundled AC-DC adapter and Planet's media chassis. Should you have the issue of power connection, please contact your local sales representative.

Please keep the AC-DC adapter as a spare part when the VC-231 is installed to a media chassis.



Width of DC Receptacle: 2.5mm

+5V for each slot

DC receptacle is 2.5mm wide that matches the central post, measuring 2.5mm wide, of the VDSL2 Bridge's DC jack. Do not install any improper unit.

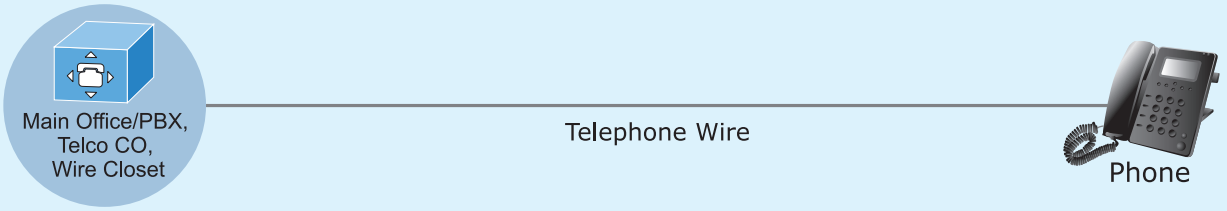
4. Connecting and using the VDSL2 Bridge

The Ethernet to VDSL2 Bridge does not require any software configuration. Users can immediately use any feature of this product simply by putting the plug in the receptacle and turning it on. There is some key limitation on the VDSL2 Bridge. Please check the following items:

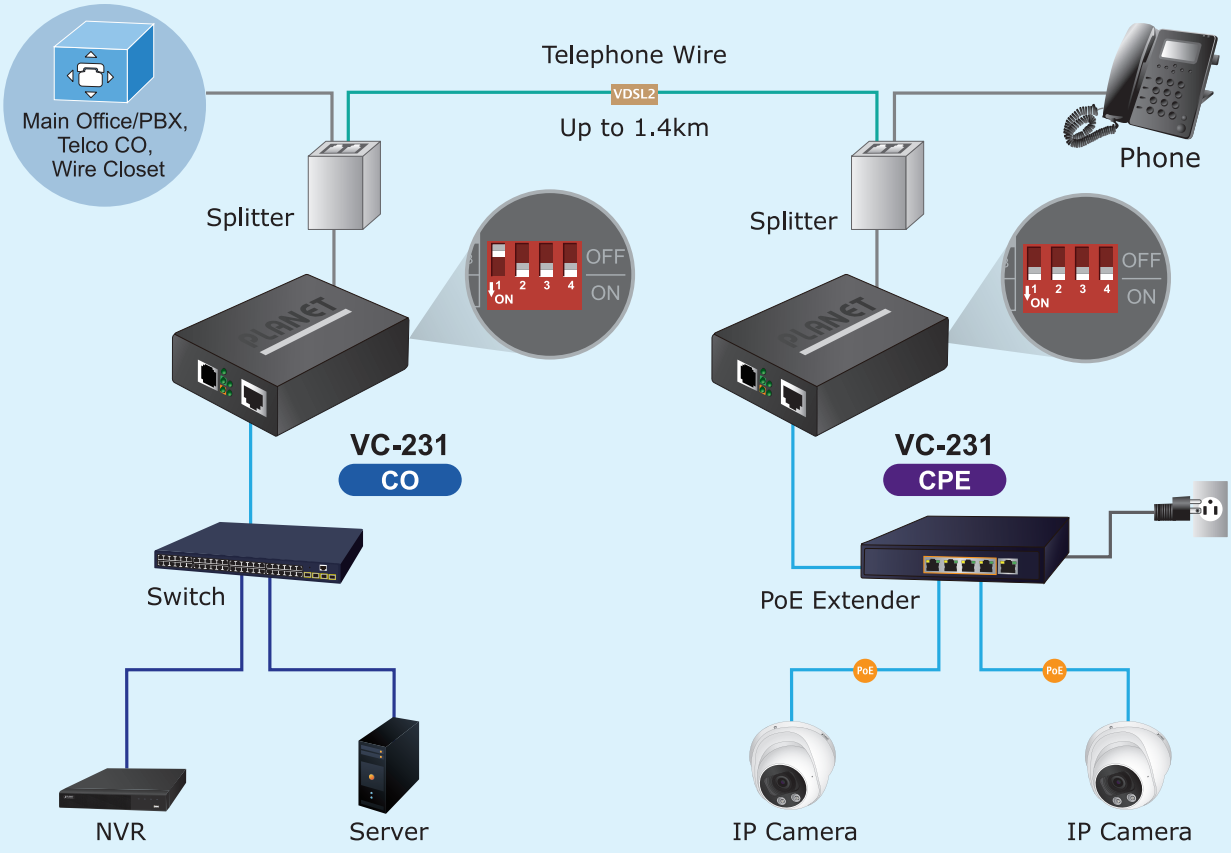
- The device can be used for **Point-to-Point** (one **CO** device to one **CPE** device) connection or **Point-to-Multipoint** (one multi-port **CO** device to multi **CPE** devices) and allows data and voice to work on the same telephone lines.
- The VC-231 provides only one RJ11 connector for VDSL2 port to build VDSL2 connection. For voice device connection, there is an additional splitter from the package of the VC-231.
- The VC-234 provides two RJ11 connectors for VDSL2 port. One is for voice device connection (like telephone) and the other one for VDSL2 network link connection.
- Depending on the quality of telephone line, the maximum distance of one VDSL2 segment is 1.4km (4593ft) with AWG 24 telephone wires. The distance could vary on the quality of telephone wires.

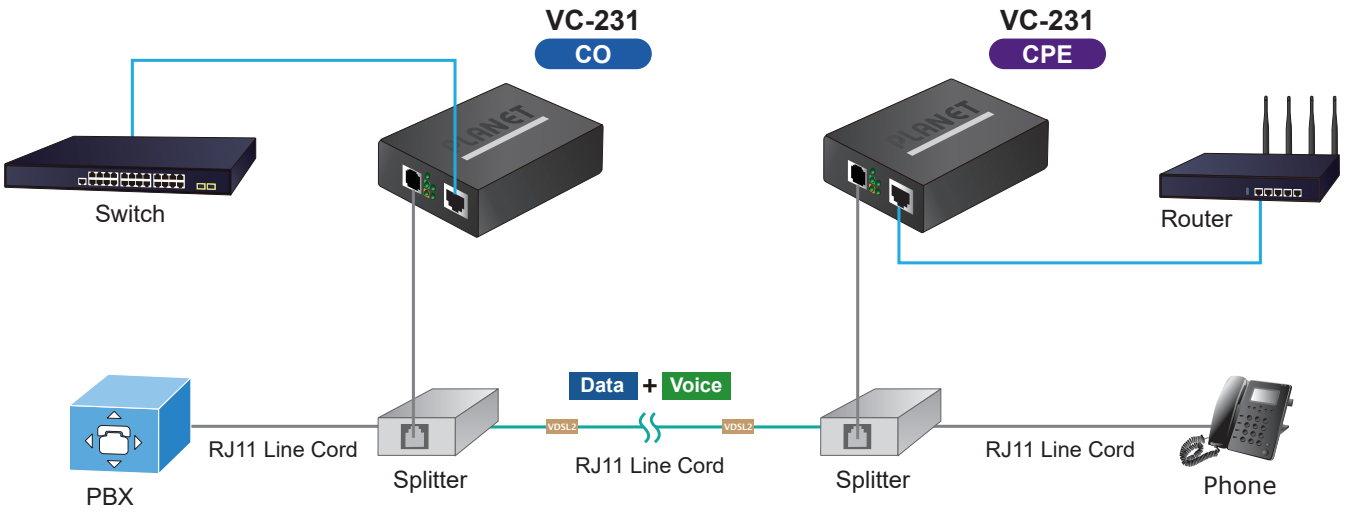
LAN to LAN Connection

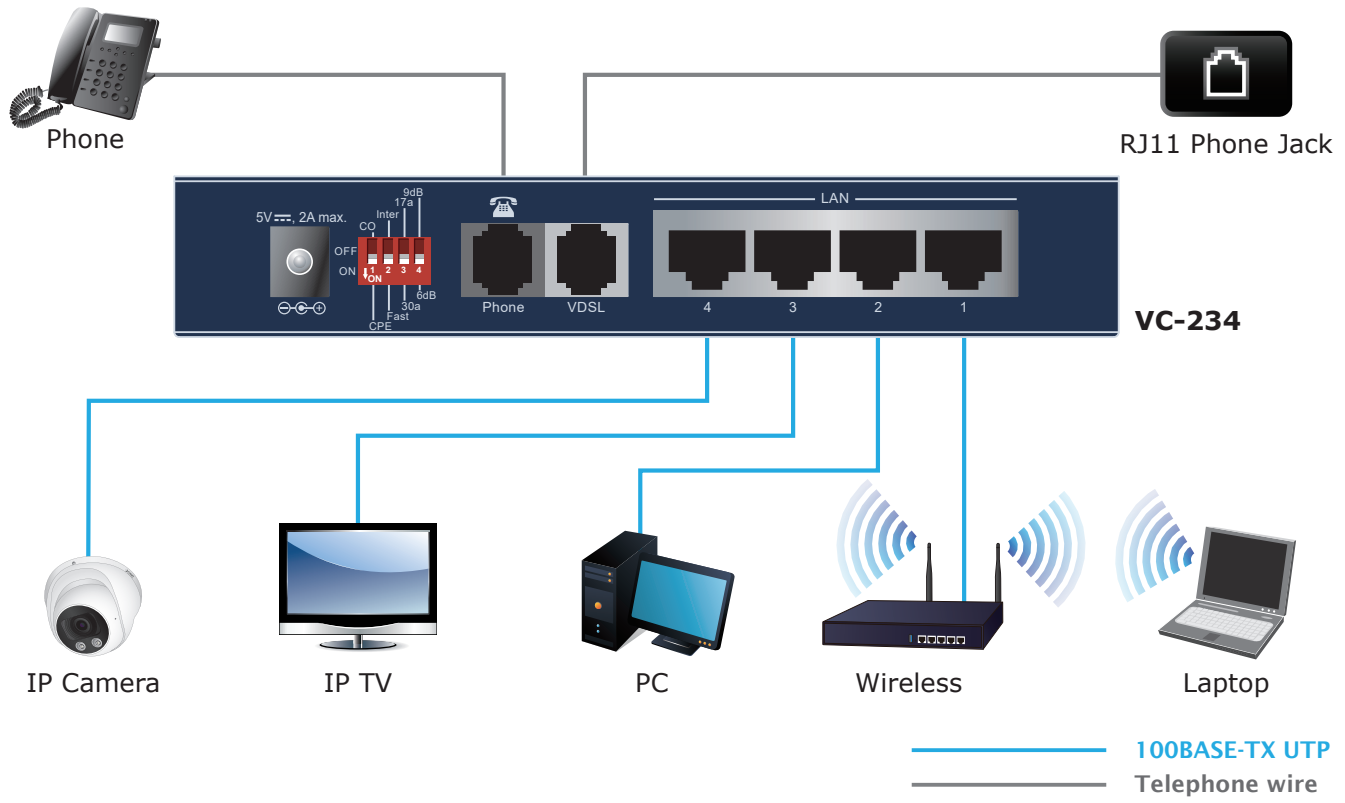
Ethernet Telephone Network



Ethernet over VDSL2 and Telephone Network



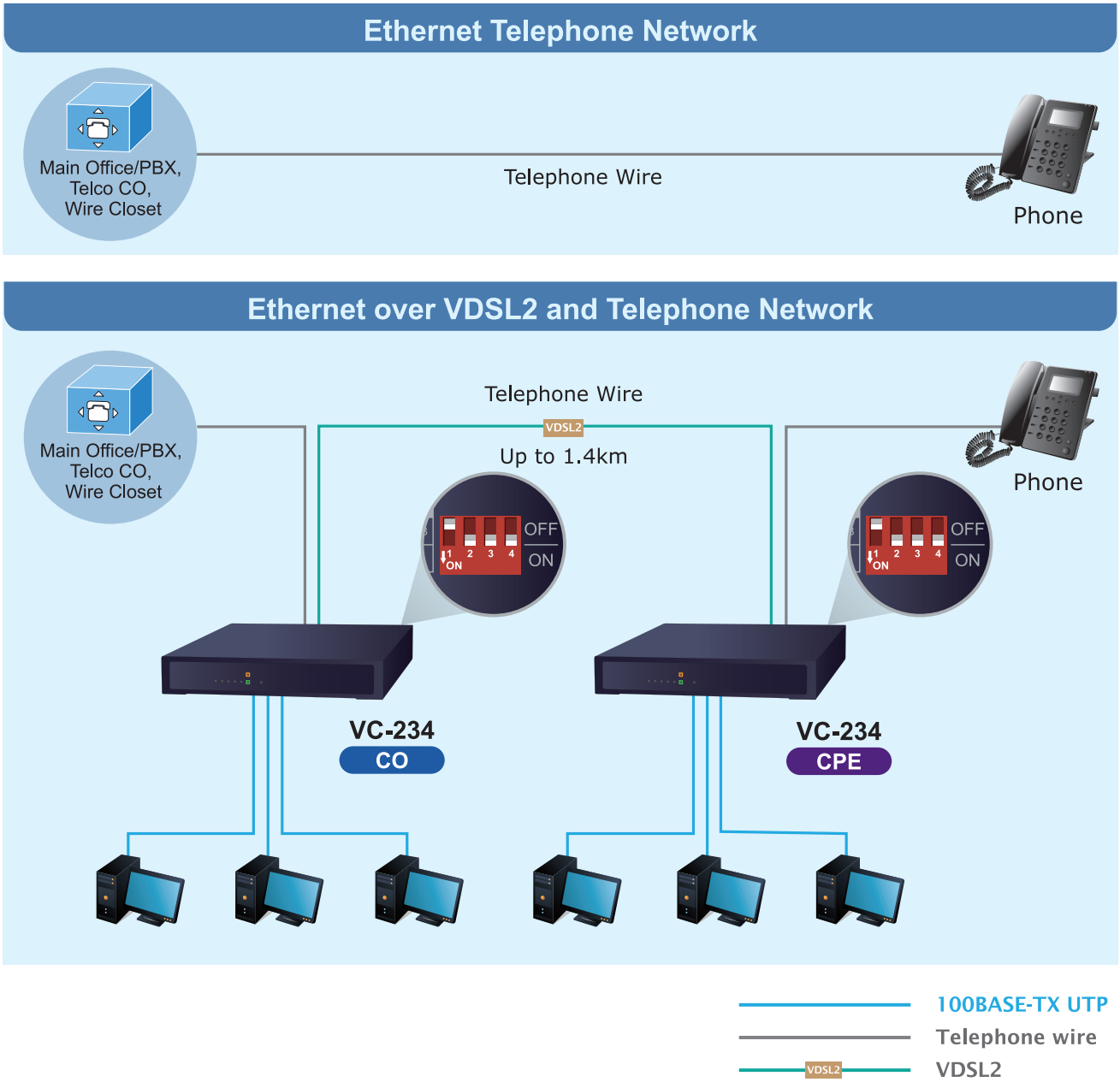

VC-231
CO
VC-231
CPE
Switch
Router
PBX
RJ11 Line Cord
Splitter
Data + Voice
VDSL2
VDSL2
RJ11 Line Cord
Splitter
RJ11 Line Cord
Phone
100BASE-TX UTP
Telephone wire
VDSL2


Phone
RJ11 Phone Jack
5V, 2A max.
Inter
CO
OFF
ON
CPE
Fast
Phone
VDSL
LAN
4
3
2
1
VC-234
IP Camera
IP TV
PC
Wireless
Laptop
100BASE-TX UTP
Telephone wire

4.1 Point-to-Point Application – LAN to LAN Connection

Two sets of the VDSL2 Bridge could be used to link two local area networks that are located in a different place. Through the normal telephone line, it could be set up as a **100/100Mbps (Fast, 30A 6dB)** symmetric backbone, with one being VDSL2 Bridge must be Master **(CO mode)** and the other one, Slave **(CPE mode)**.

LAN to LAN Connection



Refer to the following procedure to set up the VDSL2 Bridge LAN to LAN connection.

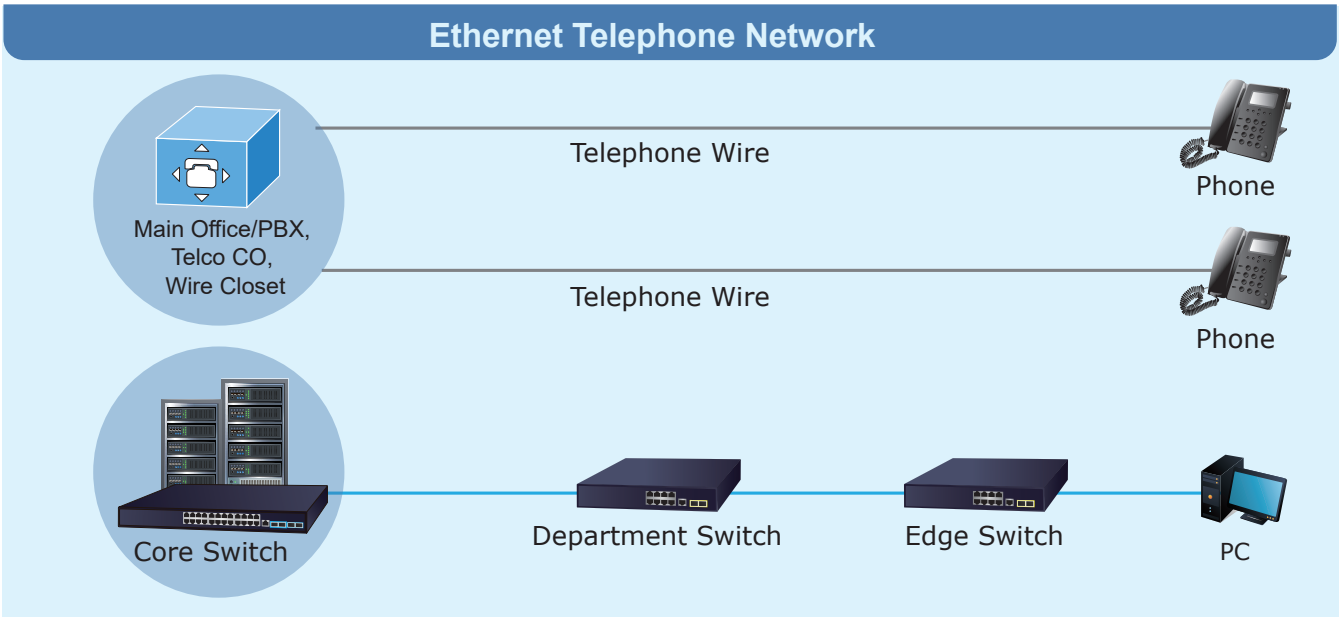
1. **[LAN1]** Set the VDSL2 Bridge at LAN 1 to be **CO** mode from the DIP switch.
2. **[LAN2]** Set the VDSL2 Bridge at LAN 2 to be **CPE** mode from the DIP switch.
3. Power on the VDSL2 Bridge CO and CPE at both sides by connecting its power source.
4. Power LED will illuminate.
5. Connect VDSL line from another VDSL device to RJ11 **VDSL port** of the VDSL2 Bridge.
6. **VDSL LNK LED** will blink to illuminate at both VDSL2 bridges.
7. Connect telephone to the RJ11 **Phone port** of the VDSL2 Bridge.
8. Connect the VDSL2 Bridge Ethernet **LAN port to** other network device via regular Cat.5 UTP cable for VC-231/VC-234.

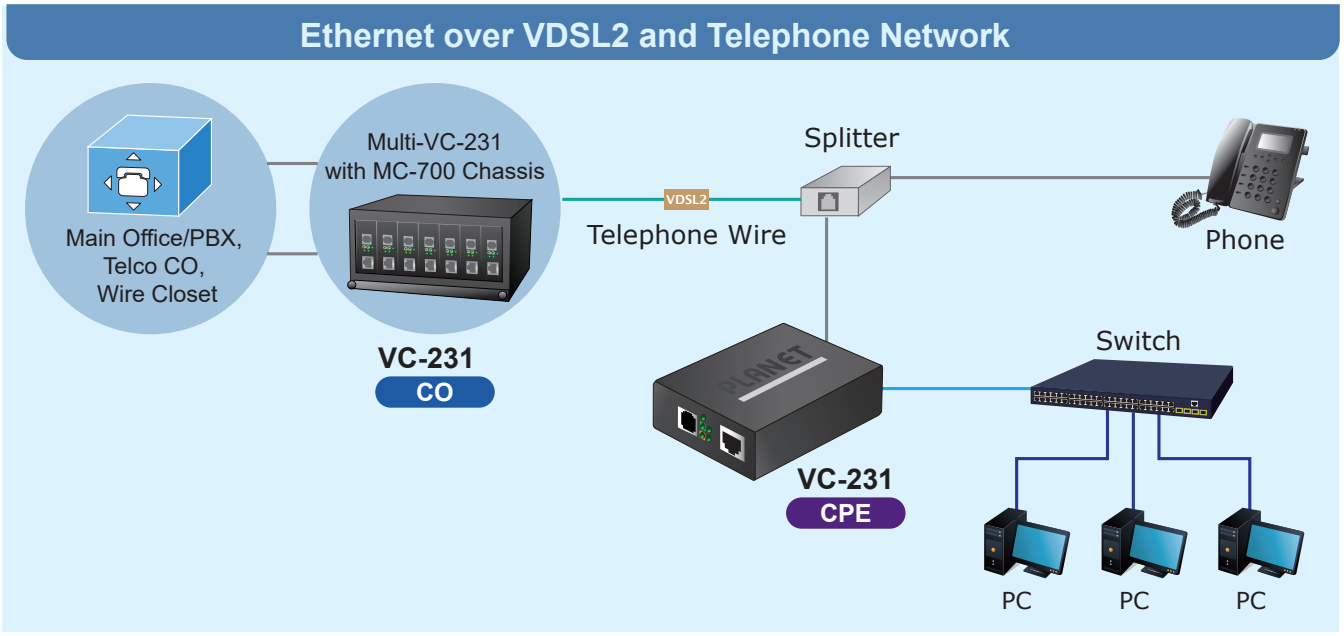
4.2 Point-to-Multipoint Application -- Connect to IP DSLAM

To build a local Internet in apartments, hotels, campuses and hospitality environments, it requires:

- The multi-port VDSL2 IP DSLAM or VDSL2 switch operates as a **CO Master** and needs to be placed in the wiring center (MDF room) and connects to the telephone line system.
- On the other hand, it needs to install one or many **CPE Slaves** (the VC-231 or VC-234 VDSL Bridge) on the individual client side and connect to the multi-port Master through the telephone lines.

Multi-LAN Connection





100BASE-TX UTP
1000BASE-T UTP
Telephone wire
VDSL2

Refer to the following procedure to set up the VDSL2 Bridge to IP DSLAM connection.

1. **[Remote End]** Set the remote IP DSLAM/VDSL2 switch to **CO** mode with proper VDSL2 profile.
2. **[Local End]** Set the VDSL2 Bridge at the local end to **CPE** mode from the DIP switch.
3. Power on the VDSL2 Bridge CPEs by connecting its power source.
4. Power LED will illuminate.
5. Connect VDSL line from IP DSLAM/VDSL2 switch to RJ11 **VDSL port** of the VDSL2 Bridge.
6. **VDSL LNK LED** will blink to illuminate.
7. Connect telephone to the RJ11 **Phone port** of the VDSL2 Bridge.
8. Connect the VDSL2 Bridge Ethernet **LAN port** to other network device via regular Cat.5 UTP cable.

When deciding where to put the converter and/or prolong the operational life of the bridge, please also refer to the following points:

- It is accessible and cables can be connected easily.
- Cabling is away from sources of electrical noise such as radios, transmitters, motors, power lines and fluorescent lighting fixtures.
- Do not place objects on top of any unit or stack.
- Water or moisture cannot enter the VDSL2 Bridge.
- A minimum of 25mm away from other deuces should be placed for a good ventilation.

5. Product Specifications

Product	VC-231	VC-234
Hardware Specifications		
10/100BASE-TX RJ45 Port	1 auto-MDI/MDI-X port	4 auto-MDI/MDI-X ports
Phone Port	Additional splitter for POTS connection	1 RJ11, built-in splitters for POTS connection
VDSL Port	1 VDSL2 RJ11 female phone jack Twisted-pair telephone wires (AWG-24 or better) up to 1.4km	
DIP Switch & Functionality	4-position DIP switch ● **CO** or **CPE** mode selectable ● Selectable **Interleaved** and **Fast** mode ● Selectable target **17A/30A profiles** ● Selectable target **SNR mode**	
Dimensions (W x D x H)	94 x 70.3 x 26.2 mm	155 x 86 x 26 mm
Weight	196g	368g
Power Requirements	DC 5V, 2A external power	
Power Consumption/ Dissipation	2.1 watts/7.1BTU (Power on without any connection) Max. 4.8 watts/16.3BTU (Full Loading)	Max. 2.1 watts/7.1 BTU (Power on without any connection) Max. 3.5 watts/11.9BTU (Full Loading)
LED Indicators	● 1 x power: Green ● 1 x 10/100BASE-TX LNK/ACT: Green ● 1 x VDSL: Green ● 1 x CO: Green ● 1 x CPE: Green	● 1 x power: Green ● 4 x 10/100BASE-TX LNK/ACT: Green ● 1 x VDSL: Green ● 1 x CO: Green ● 1 x CPE: Green
Housing	Metal	

Switch Specifications	
Switch Processing Scheme	Store-and-Forward
Address Table	1K entries
Maximum Packet Size	1522bytes
Standards Conformance	
VDSL Compliance	■ VDSL-DMT ● ITU-T G.993.2 VDSL2 (Profile 17a/30a support) ● ITU-T G.997.1 ● ITU-T G.998
ADSL Compliance	■ Capable of **ADSL2/2+** standard ● ITU G.992.3 G.dmt.bis ● ITU G.992.5 G.dmt.bisplus ● Data Rate: Up to 24Mbps
Standards Compliance	IEEE 802.3 Ethernet IEEE 802.3u Fast Ethernet IEEE 802.1p Class of Service ITU-T G.993.2 VDSL2 (Profile 17a/30a support) ITU-T G.997.1 ITU-T G.998
Regulatory Compliance	FCC Part 15 Class A, CE
Environment	
Temperature	Operating: 0~50 degrees C Storage: -10~70 degrees C
Humidity	Operating: 5~95% (non-condensing) Storage: 5~95% (non-condensing)

Performance					
RJ11 Performance* (Downstream/ Upstream)	Distance (meter)	Interleave (Downstream/Upstream: Mbps)			
		17A		30A	
		6dB	9dB	6dB	9dB
	200m	94/57	94/57	94/94	94/94
	400m	94/55	94/54	94/94	94/94
	600m	94/55	93/52	82/94	80/92
	800m	81/46	73/44	68/77	60/71
	1000m	51/30	39/26	42/43	29/37
	1200m	43/14	38/12	31/29	27/27
	1400m	39/9	33/10	26/24	23/22
	Distance (meter)	Fast (Downstream/Upstream: Mbps)			
		17A		30A	
		6dB	9dB	6dB	9dB
	200m	94/62	94/62	94/94	94/94
	400m	94/59	94/57	94/94	94/94
	600m	94/56	94/53	82/94	81/94
	800m	78/47	78/44	76/75	69/68
	1000m	61/27	61/22	45/42	40/37
	1200m	40/13	40/11	29/28	25/25
	1400m	36/6	36/6	23/21	21/20
	* The performance data above is for reference only. The actual data rate will vary on the quality of the copper wire and environmental factors.				

6. Troubleshooting

SYMPTOM:

VDSL LNK LED does not light up after wire is connected to the VDSL port.

CHECKPOINT:

1. Verify the length of the wire (not more than 1.4km) connected between the VDSL2 Bridges. Please also try to adjust the DIP switch or the VDSL2 Bridge to the other SNR mode.
2. Please note you must use one VDSL2 Bridge in CO mode and the other VDSL2 Bridge in CPE mode to make connection to each other work.

SYMPTOM:

TP LED does not light after cable is connected to the port.

CHECKPOINTS:

1. Verify you are using the Cat.5 or better cable with RJ45 connector to connect to the port.
2. If your device (like LAN card) supports auto negotiation, manually set at a fixed speed of your device to solve this issue.
3. Check whether the power of the Converter/Bridge and the connected device are on or not.
4. The port's cable is firmly seated in its connectors in the switch and in the associated device.
5. The connecting cable must be good and the correct type.
6. The connecting device, including any network adapter, must be functional.

7. FAQs

Q1: What is VDSL2?

A1: VDSL2 (Very High-Bit-Rate Digital Subscriber Line 2), G.993.2, is the newest and most advanced standard of xDSL broadband wire line communications. Designed to support the wide deployment of Triple Play services such as voice, data, high definition television (HDTV) and interactive gaming, VDSL2 enables operators and carrier to gradually, flexibly, and cost efficiently upgrade the existing xDSL infrastructure.

Q2: What is SNR and what's the effect?

A2: In analog and digital communications, Signal-to-Noise Ratio, often written as SNR, is a measure of signal strength relative to background noise. The ratio is usually measured in decibels (dB).

In digital communications, the SNR will probably cause a reduction in data speed because of frequent errors that require the source (transmitting) computer or terminal to resend some packets of data. SNR measures the quality of a transmission channel over a network channel. The greater the ratio, the easier it is to identify and subsequently isolate and eliminate the source of noise.

Generally speaking, the higher SNR value gets, the better the line quality gets, but performance is lower.

Q3: What is the best distance for the VDSL2 Bridge?

A3: In order to guarantee the stability and better quality of network, we suggest the distance should not exceed 1.4 kilometers.

8. Customer Support

Thank you for purchasing PLANET products. You can browse our online FAQ resource on PLANET Website first to check if it could solve your issue. If you need more support information, please contact PLANET switch support team.

PLANET online FAQs:
https://www.planet.com.tw/en/support/faq

Switch support team mail address:
support@planet.com.tw

APPENDIX: Wall-mount and Chassis Installation

This part describes how to install your VDSL2 Bridge and make connections to it.

Please read the following topics and perform the procedures in the order being presented.

■ Wall-mount Installation

Step 1: Please find the wall that can mount the VDSL2 Bridge.

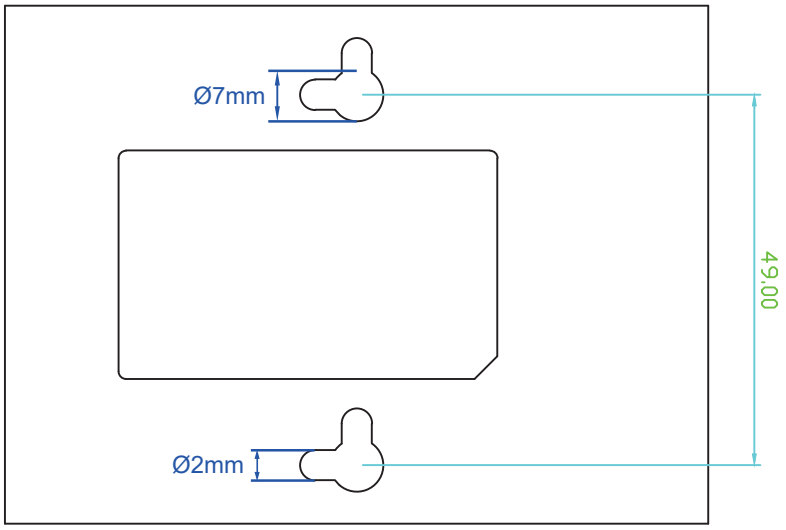
Step 2: Screw two screws on the wall.

Step 3: Hang the VDSL2 Bridge on the screws from the wall.

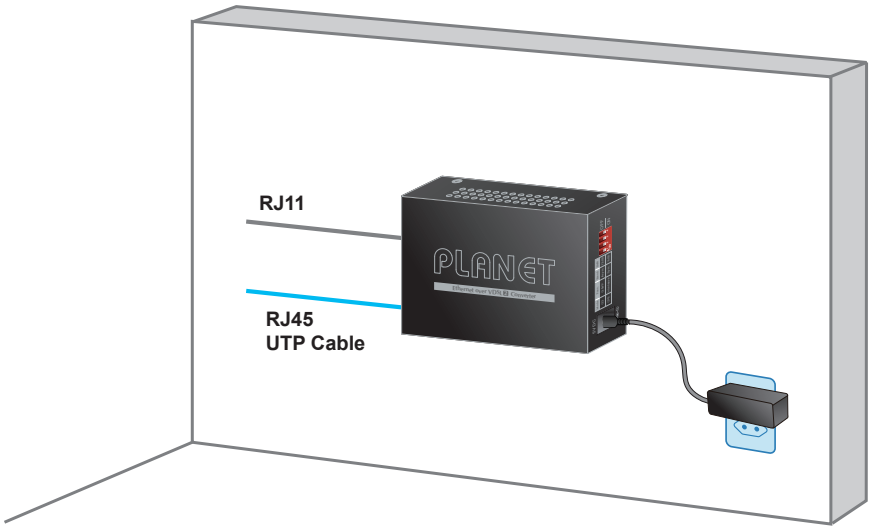
Step 4: Refer to chapter 3.3 Power Information for power supply to the VDSL2 Bridge.

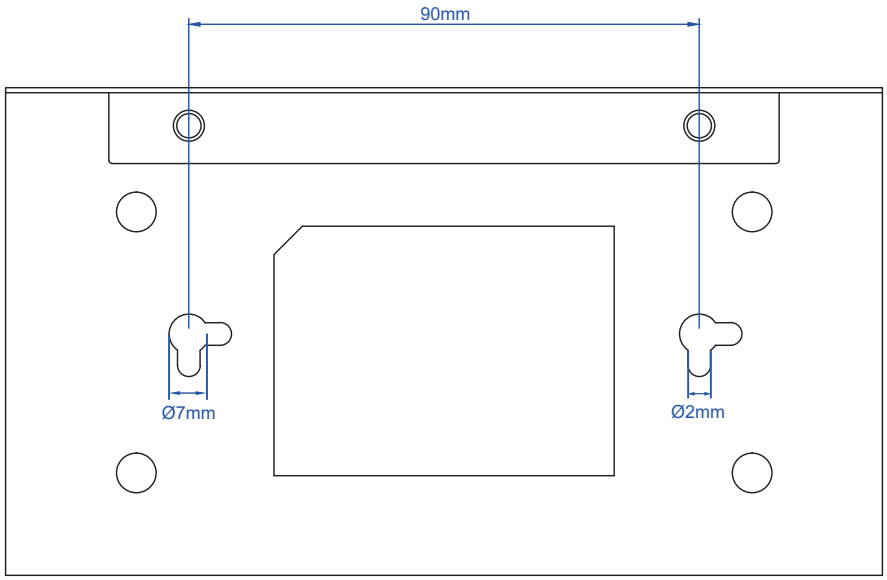
Note

Before mounting the device to the wall, please check the location of the electrical outlet and the length of the Ethernet cable.

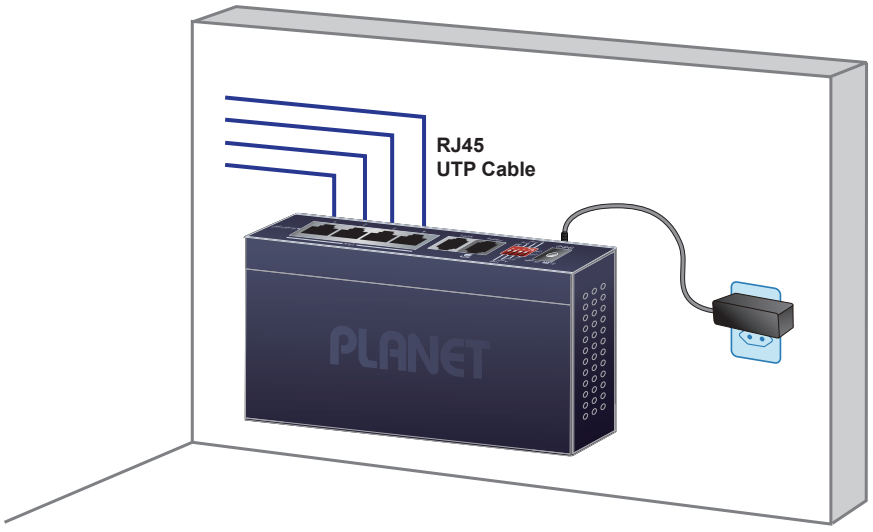


VC-231 Switch Bottom Side





VC-234 Switch Bottom Side



■ Chassis Installation and Rack Mounting (VC-231)

To install the Ethernet over VDSL2 Bridge in a **10-inch** or **19-inch** Converter Chassis with standard rack, follow the instructions described below.

Step 1: Place your VDSL2 Bridge on a hard flat surface, with the front panel positioned towards your front side.

Step 2: Carefully slide in the module until it is fully and firmly fitted into the slot of the converter chassis.

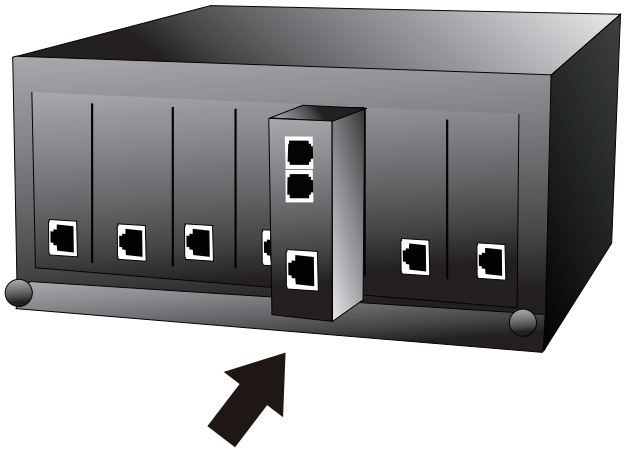


Figure Appendix 1: Insert a VDSL2 Bridge into an available slot

Step 3: Attach a rack-mount bracket to each side of the Converter Chassis with supplied screws attached to the package.

Step 4: After the brackets are attached to the Converter Chassis, use suitable screws to securely attach the brackets to the rack.

Step 5: Connect one end of the power cable to the **10-inch** or **19-inch** Converter Chassis.

Step 6: Connect the power plug of the power cable to a standard wall outlet, and then power on the **10-inch** or **19-inch** Converter Chassis. The PWR LED should be lit.

Note	Please refer to your User's Manual for setting up the device.